must take account of behavioural factors that may confound the impact of the health intervention. In this case three such factors must be taken into account.

Firstly, a lifestyle that leads to high cardiovascular risk (poor diet, smoking, etc) will also increase the risk of premature death generally. This undermines the assumption of Pharoah and Hollingworth that people with cardiovascular disease have the same all cause mortality as the general population. This is unlikely because treatment with cholesterol lowering drugs alone will not modify the underlying behaviour that places people at high risk of dying prematurely.

Secondly, the use of magic bullets may instil a feeling of invulnerability, which significantly reduces the motivation for modifying lifestyle. Statins may even encourage deleterious health behaviour in people at high risk,³ which counterbalances the benefits arising from treatment to lower lipid concentrations by increasing mortality from other causes—for example, lung cancer. This indirect behavioural effect may outweigh the benefits arising from an initial reduction in cardiac mortality related to the use of such drugs.

Thirdly, compliance is a large problem for any treatment in which a symptom free patient is required to take drugs for no apparent immediate benefit. The analysis of Pharoah and Hollingworth assumes degrees of compliance equal to those seen in the Scandinavian simvastatin survival study⁴ and the west of Scotland coronary prevention study,⁵ but compliance in reality is significantly lower. Thus the long term efficacy of lipid lowering drugs is likely to be significantly below the values in the trials because of reduced patient compliance.

Despite such reservations, some of which are difficult if not impossible to overcome with currently available data, we agree with the general conclusion of Pharoah and Hollingworth that lipid lowering drugs should be targeted at groups with the highest baseline cardiovascular risk. We question, however, the exact level and nature of overall health benefits that are likely to arise as a consequence of the use of such treatment.

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Full treatment of the costs and benefits is needed

EDITOR,—P D P Pharoah and W Hollingworth have produced an interesting article that is of little benefit to the debate on the health economics of lowering lipid concentrations.¹ The life table approach suffers from the same deficiency as we² have pointed out for the Sheffield risk factor table.³ Megnien *et al* have shown that the risk

table does not differ significantly from the currently accepted guidelines once correct assumptions are made.⁴

The major deficiency in the life table approach is simple—death is cheap for the health service. The principal saving for lipid lowering agents is in procedures not needed and hospital beds not required. A full cost analysis has already been published for the Scandinavian simvastatin survival study for the United States and shows reductions in cardiovascular procedures of 31% and hospital stays of 34%.⁵ This leads to a net cost of the drug of 28 cents (19p) a day. The data for primary prevention in men in the west of Scotland coronary prevention study would imply a cost of treble that for secondary prevention on the basis of the number of events.⁶ The cost analysis for secondary prevention for the United Kingdom seems to imply a cost per life year saved of £3000-6000, depending on the assumptions made, not £361 000 for secondary prevention.⁷ This is based on reducing 86 cardiovascular deaths to 23, 679 hospital days to 231, and 19 angioplasties to six—that is, £237 000 reduced to £73 800 per 100 patients treated.⁷

It is difficult to find other treatments that have been as thoroughly evaluated as lowering lipid concentrations in terms of cost-return analysis. For secondary prevention the data are as good as those for severe hypertension (diastolic pressure >110 mm Hg), and for primary prevention they are similar to those for treating moderate hypertension. Unless cost analyses are conducted in full and include the cost of procedures, visits to outpatient departments and general practitioners, and stays in hospital any data that arise are highly misleading and not useful in health economic terms.

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Statin treatment should be started early

EDITOR,—As doctors who have managed patients with hypercholesterolaemia despite widespread scepticism, particularly in the *BMJ*,¹ we should be feeling pleased that one of our main treatments has been proved safe and effective. However, the results of the recent statin trials²⁻³ were perhaps too good and we are now told by P D P Pharoah and W Hollingworth that the NHS cannot afford such treatment.⁴ Given that reduction in coronary events is a class effect, then one simple way to double cost effectiveness is to

prescribe fluvastatin rather than simvastatin or pravastatin because at therapeutically equivalent doses it costs about half as much.⁵ The fundamental problem with focusing on short term cost effectiveness as the criterion for rationing these drugs is, however, that it ignores the underlying pathophysiology of atherosclerosis, which is a chronic disorder starting in early adulthood and progressing over decades. By middle age much of the damage is already done. Despite the favourable results of the statin trials it should not be overlooked that two thirds of the coronary events were not prevented. If the argument that only those at highest initial risk should be treated is taken to its logical conclusion then we should start statin treatment only on the day before an infarction.

We are worried that papers such as those by Pharoah and Hollingworth will be used by purchasing authorities to deny treatment to young patients with hypercholesterolaemia in whom coronary disease might be preventable altogether. This can never be shown to be cost effective if "lives saved in the future are worth less than those saved today." Such a statement should make us all shudder.

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Costs in general practice

EDITOR,—P D P Pharoah and W Hollingworth have calculated the potential costs and benefits of the increased use of statins to prevent deaths from coronary heart disease in a health authority.¹ A similar and simpler calculation can be done for the patients of a British general practice.

The results of the west of Scotland coronary prevention study of pravastatin treatment in men with raised cholesterol concentration showed a headline reduction of 32% in cardiovascular mortality and 22% in all cause mortality after five years.² The Scandinavian simvastatin survival study of simvastatin treatment in the secondary prevention of coronary heart disease addressed a related issue but in a group with a much higher risk of premature death.³

What are the costs and benefits of these interventions likely to be in practice?

In the case of primary prevention, a general practitioner's list of 2000 patients will contain about 75 men aged 45-65 with a cholesterol concentration in the study range (average 7 mmol/l).⁴ To treat each man with pravastatin 40 mg daily will cost £808 a year, a total of £60 600. In Oxfordshire this one intervention would therefore require an increase of around 50% in the current total drugs budget for general practice. This assumes that no women and no one outside the study age range of 45-65 years will be